Sub A6

1. A method of adding an information storage device to a plurality of information storage devices in an information processing system in which a processor is connected for communication with the information storage devices by means of a log structured array (LSA) controller in which the information is stored as a plurality of stripes extending across the devices of the array, the LSA controller further defining a directory, the method comprising connecting the additional information storage device to the LSA controller and logically appending an additional strip provided to each existing stripe by the additional storage device to the end of each stripe in the directory.

2. The method of claim 1, further comprising configuring the plurality of information storage devices as an N+1 array.

3. The method of claim 1, wherein each stripe comprises N information strips and one parity strip, each information strip storing an integer number of logical tracks.

4. The method of claim 1, wherein the directory comprises a LSA directory which specifies the location of each logical track in terms of the ID of the stripe to which the track belongs and the offset of the track within the stripe.

5. The method of claim 1, wherein prior to the addition of the additional storage device, the parity strips are rotated amongst the N+1 information storage devices in accordance with the RAID-5 architecture, the method further comprising moving selected parity strips to the additional information storage device at locations that would have stored parity strips had the array originally comprised N+2 information storage devices.

6. The method of claim 5, wherein the data and parity strips are moved to the additional storage device during normal IO operations to the devices.

7. The method of claim 5, wherein a background task is defined by the controller to move the data and parity strips to the additional storage device.

8. The method of claim 6, wherein a bitmap is defined by the controller, each bit of the bitmap representing an array stripe and indicating whether the data and parity strips of the stripe are located in their original position or in the position appropriate to the expanded array.

9. The method of claim 1, wherein the additional information storage device is initialised to all binary zeros prior to connection to the controller.

10. The method of claim 1, further comprising connecting a plurality of additional information storage devices to the log-structured array controller and logically appending the additional strips, provided to each existing stripe by the additional storage devices, to the end of each stripe in the LSA directory.

11. The method of claim 1, wherein connecting the additional information storage device to the LSA controller further comprises:

initializing the new disk is to all binary 00s so that it can be included in the parity calculations without modifying the parity already on disk; temporarily suspending accesses to the RAID array and flushing any data cached by RAID 5 array location from the cache;

adding the new disk ( as a member of the RAID array; and

applying an algorithms to optionally relocate the parity and/or the data.

12. A log structured array (LSA) controller comprising a logic device configured to control the transfer of information between a processor and a plurality of information storage devices in which the information is stored as a plurality of stripes extending across the devices of the array, and further configured upon the addition of a new information storage device to the array, to logically append to the end of each stripe in a directory a new strip provided for the new information storage device.

13. The LSA controller of Claim 12, wherein the plurality of information storage devices are configured as an N+1 array.

14. The LSA controller of Claim 12, wherein each stripe comprises N information strips and one parity strip, each information strip storing an integer number of logical tracks.

15. The LSA controller of Claim 12, wherein the directory further comprises an LSA directory specifying the location of each logical track in terms of the ID of the stripe to which the track belongs and the offset of the track within the stripe.

16. A log structured array (LSA) controller for adding an information storage device to a plurality of information storage devices in an information processing system in which a processor is connected for communication with the information storage devices by means of a log structured array (LSA) controller in which the information is stored as a plurality of stripes extending across the devices of the array, the LSA controller comprising:

a directory;

means for connecting the additional information storage device to the LSA controller;andmeans for logically appending an additional strip provided to each existing stripe by the additional storage device to the end of each stripe in the directory.

17. The A log structured array (LSA) controller of claim 16, further comprising means for configuring the plurality of information storage devices as an N+1 array.

18. The A log structured array (LSA) controller of claim 16, wherein each stripe comprises N information strips and one parity strip, each information strip storing an integer number of logical tracks.

19. The A log structured array (LSA) controller of claim 16, wherein the directory comprises a LSA directory which specifies the location of each logical track in terms of the ID of the stripe to which the track belongs and the offset of the track within the stripe.

20. An information storage system comprising:

a plurality of information storage devices;

a processor connected for communication with the information storage devices by means of a log structured array (LSA) controller in which the information is stored as a plurality of stripes extending across the devices of the array,

An LSA controller comprising a directory, the LSA controller configured to connect an additional information storage device to the LSA controller and logically append an additional strip provided to each existing stripe by the additional storage device to the end of each stripe in the directory.

21. The information storage system of claim 20, wherein the plurality of information storage devices comprise an N+1 array.

22. The information storage system of claim 20, wherein each stripe comprises N information strips and one parity strip, each information strip storing an integer number of logical tracks.